Students prepare Red Planet for future visitors

Second annual Mars Settlement Design Competition draws increased participation

One hundred forty-four high school students, some of whom may live on Mars one day, got a chance to plan what living and working conditions will be on the Red Planet during the second annual JSC Mars Settlement Design Competition.

The students took up residence at JSC the weekend of February 11-13, designing living and working quarters for a human settlement on Mars. They participated in a Mars-focused version of the Space Settlement Design Competition, a program that began in California in 1984 to introduce students to the skills they will need when they join industry.

"The tremendous student enthusiasm we encountered last year during our initial competition, which attracted 72 participants, led us to greatly expand our outreach and participation this year," said Norm Chaffee, project coordinator for the event. "The 144 students who attended really challenged our ability to improve on the competition, but support across the center was just fantastic, and all the students had a memorable experience. Special thanks go to competition managers Nancy Robertson and Bonnie Dunbar, who made my job easy."

Organized into four "company" teams (Rockdonnell, Vulture Aviation, Vereinigten Flugfahrten and Grumbo Aerospace), the students worked against a deadline to design, develop and present their concept of a human community on Mars that would support 12,000 residents. They had to design an overall structure, define sources of construction materials, specify vehicles used for transportation, determine sources of electrical power and water, design computer and robotics systems, specify allocation of interior space, show examples of community design, and provide estimated costs and schedules for completion of the project.

To assist the students, each team was provided with a manager from government or industry to act as the company chief executive officer. Volunteer CEOs were Kevin Moore, NASA JSC (Grumbo Aviation); Keith Todd, NASA JSC (Rockdonnell); Jon Zelon, The Boeing Company (Vereinigten Flugfahrten); and Ramesh Khatri, United Space Alliance (Vulture Aviation).

"I see a lot of enthusiastic students here," said Khatri, director of Space Flight Operations for USA. "All of them have done their homework. They have a lot of knowledge of the planet Mars and all the research that has been done on it."

The CEOs agreed that the main lesson the students learned was how to work together. "One of the key things the students will learn is teamwork," Khatri added. "They will also learn how the real world operates. So I think the experience will be very enriching for them."

"I think that the students are going to learn to work as a team," said Todd, robotics project lead for Mission Operations. "Given an overwhelming problem, they are going to see how teamwork will help them meet their objectives."

Other volunteers conducted training sessions for the students before the actual competition began. These short seminars gave the participants a critical overview of structural engineering, operations engineering, human engineering, automation engineering, and management.

"I like robotics and I wish I could have had the opportunity to participate in this kind of competition when I was a kid, so I'm taking my opportunity by being a trainer," said Reyes Granados, USA Mission Operations Directorate robotics analyst for the space shuttle and the space station, who helped conduct the training session on automation engineering. As president of the Society of Mexican American Engineers and Scientists, Granados also represented MAES at the competition.

The students divided themselves into teams and decided what their roles would be. Working with others whom they had not met before, they learned important lessons in engineering, proposal writing, presentation skills and teamwork. All were excited to be involved in the competition.

"I'm really excited about architecture and futuristic designs," said Thomas Mosley, Silsbee High School student and member of the Grumbo Aerospace team. "I saw this competition advertised at a job fair, and I really wanted to come to it."

The students participated in the competition to learn more about Mars and to gain skills that will help them later in life. "I would like to learn to be a leader, and I would like to learn communication skills," said Alyssa Goodenberger, Clear Creek High School student and Grumbo Aerospace team member. "I want to have fun designing this community and learn something for real life when I join the workforce."

Most of the students came from high schools in Houston and Southeast Texas, but six traveled from Iowa to participate in the competition.

"We want to bring this experience back to Iowa because there is a Mars base program there for junior high students in our school system," said Brianne Tabke, a student at Woodbury Central High School in Iowa. "It would be really helpful if we could get all that we can from this to bring it back home."

Following 35-minute presentations of their 50-page proposals to a team of local NASA and industry judges during Sunday morning, the final day of the competition, the team members took a tour of JSC. The winning team, Vulture Aviation, was announced during an awards ceremony in the afternoon.

The competition was hosted and sponsored by NASA JSC, The Boeing Company, the Clear Creek Independent School District and the American Institute of Aeronautics and Astronautics. ■

Montage of NASA JSC Photos by Robert Markowitz